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AUTHOR Rehberg, Richard A.; Hotchkiss, Lawrence
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ABSTRACT

Early educational expectation, i.e., the realistic educational goal of the individual during the freshman year of secondary school, is proposed as a pivotal variable in the education attainment--family of origin sequence. Path analysis of the data from the first four waves of a five-wave, seven-year longitudinal panel study of 2790 youth from the southern tier of New York supports the tenability of that proposition, albeit more for males than for females. Early expectation is the variable which: (1) mediates a sizeable percentage of the influence of family status, measured intelligence, parental achievement socialization, and parental educational stress to specified "in-school" behaviors, to later or senior-year educational expectations, and to actual post-high school educational attainment; (2) is itself a net determinant of those specified in-school behaviors, of later expectations, and of actual educational attainment. The paper concludes with a discussion of the dynamics of early expectations and of their implications for educational policy. (Author)

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EARLY EDUCATIONAL EXPECTATIONS AS A CRITICAL VARIABLE IN THE EDUCATIONAL ATTAINMENT -- FAMILY OF ORIGIN SEQUENCE

by:

Richard A. Rehberg

and

Lawrence Hotchkiss

Department of Sociology

State University of New York at Binghamton
Binghamton, New York

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ABSTRACT

Research into the status of destination -- status of origin sequence has established that "intermediate" statuses are of critical import in understanding this process. Blau and Duncan (1967) originally found "career beginnings" or first or early occupation to be the intervening variable between status of destination and status of origin, noting that "a good part of the influence of origins on subsequent occupational life is due to the influence of origins on career beginnings, which in turn affect later careers."

In their conceptualization of the status attainment process, Haller and Portes (1973) assert that the critical mediating variable comes prior to first job. Their analysis of the Wisconsin data set establishes career aspirations as per the senior year of secondary school as the variable which mediates "most of the influence of antecedent factors on status attainment."

Drawing upon literature which finds career orientations crystallizing prior to the terminal year of high school, this paper analyzes data from a four-wave, five-year longitudinal panel study of 2790 youth and finds support for the proposition that, for males more than for females, the critical mediating variable in the status attainment process is that of early educational expectations, i.e., the realistic educational goals which youth express during the initial or freshman year of secondary school. Not only does early expectations mediate the influence of family status, intelligence, achievement socialization and educational stress to later or senior-year expectations and subsequent post-high school educational attainment, early expectations is itself an important net determinant of those variables and of specific "in-school" student behaviors. The paper concludes with a discussion of the dynamics of early expectations and of their implications for educational policy.

INTRODUCTION[1]

Concern for the consequences of inequality and a persistent liberal faith in the ability of schooling to reduce inequality of opportunity, if not of rewards,[2] has no doubt been a moving force behind several major inquiries which have sought to assess educational attainment as a link between the individual's ultimate status of destination and his initial status of origin.[3]

There can be little question that the publication of Inequality by Christopher Jencks, et. al. (1972) has had a chastening effect upon faith in schooling as a potent instrumentality of social redress.[4] However, the fact remains that among those identifiable and measurable determinenats of occupational attainment and income,[5] educational attainment is both a primary mediator of family background, parental socialization, and intelligence to occupational attainment and a major source of direct influence on occupational attainment and, by way of occupation, on income.[6]

Luck notwithstanding,[7] the critical role of education in the status attainment and transmission process has occasioned research into the determinants of years of schooling completed. From this research has emerged two basic models of educational attainment. (1) the Blau and Duncan model, and (2) the Wisconsin model, (Haller and Portres, 1973). What distinguishes the Blau and Duncan model from the Wisconsin model is the latter's effort to identify and quantify the role of social psychological variables as dynamic interpretative constructs in the educational attainment -- status or origin sequence. Pivotal in this function are career aspirations, which, as Haller and Portes note:

> . . . mediate most of the influence of antecedent factors on status attainment. Even when educational attainment is taken into account, occupational aspirations still exercise a significant direct effect on occupational attainment.

> The execution of occupational and educational aspirations appears to be a central process in early adult status attainment, not only because it represents a clear expressive orientation toward desirable goals but also because it is likely to involve a realistic appraisal of possibilities conveyed to ego by significant others and his own self-evaluations (1973:68).

It is our major thesis in this paper, however, that the Wisconsin data set would have generated an even more comprehensive understanding of the educational attainment process had the initial measurement of educational intentions been in the freshman or sophomore year of high school rather than in the senior year. For, it is our contention that fresman or "early" expectations[8] not only link family background, parental socialization, and ability variables with specified "in-school" behaviors, "later" expectations, and actual educational attainment, but that early expectations is an independent or net determinant of those consequent variables as well. In essence, then, we propose that the "point of balance" in the educational attainment — status of origin sequence be moved back in time from the career intentions of the terminal year of high school to the educational expectations of the initial year.[9]

EARLY EXPECTATIONS AS A VARIABLE

As a construct, educational expectations has been most often depicted as a dependent variable, as the effect of such determinants as family status, measured intelligence, parental achievement socialization and educational encouragement, and influences from significant others.[10]

Yet, those few studies which have conceptualized educational expectations or intentions not only as a dependent but as an independent and/or as an intervening variable have generated insights into student behavior and the organizational context of the high school.

Boocock, using the more generic construct of "motivation to achieve" has interpreted both Kahl's study of "common-man" boys and Rosen's study of middle and working class boys as indicating that "once students acquire the motivation to achieve, their social background does not seem to hold them back (1972:61)."

Boyle, in a most perceptive analysis of data from 2,229 boys enrolled in 35 Iowa public high schools in 1965, reported significant coefficients for Iowa Test scores regressed upon educational aspirations. He interpreted those coefficients as indicating that:

> some kinds of boys (those who eventually plan on college) have been learning at a sufficiently faster rate that, quite aside from their starting position, they end up almost a full quintile superior to the other boys--quite a marked change! Finally, when both aspirations and parental education are entered into the regression equation simultaneously, the effects of aspirations on the rate of learning remain quite strong, while the effects of parental education are reduced relatively more, with only one of its four measures approaching importance at all. There is good evidence, in other words, that aspirations are an important factor biasing the rate of learning (at least as measured by the Iowa Tests), while parental education is, if anything, only slightly important (1969:79).

Rehberg and Hotchkiss, in a recent paper assessing the influence of the guidance counselor on educational expectations, have reported that "early" expectations exerts a significant direct effect on the level of educational advice a counselor accords a student during his sophomore year and that those early expectations account for some 22 percent of the total effect of status on counselor advice for males and 14 percent for females (1972:339-61). Williams has reported a similar finding for teacher advice (1972:129).

From these studies, then, begins to emerge the outlines of a pattern for early educational expectations; namely, that it exerts an effect on subsequent behaviors

over and above that attributable to family background and that, when controlled, it attenuates at least some portion of the relationship between those behaviors and family status, thus suggesting that early expectations is a variable which intervenes between or links those two sets of constructs.

Our perspective on early expectations, then, is three-faceted; that is, we view early expectations as: (1) a dependent variable, reflecting the influence of such antecedents as family status, parental achievement socialization and educational stress, and measured intelligence; (2) an independent variable, exerting an effect on such consequent variables as specified in-school behaviors, later expectations, and actual educational attainment, net of antecedent influences; and (3) an intervening variable, linking its antecedents with its consequences thereby attentuating the relationship between, for example, later expectations or actual attainment with family socio-economic status.

THE PROPOSED MODEL

With Parsons (1959) and Dreeben (1968), we believe that a major axis about which many activities in American elementary and secondary schools is organized is that of achievement, i.e., the propensity of the student to perform in accord with standards of excellence. And, with Parsons (1959) and Cicourel and Kitsuse (1963) we assert that the manifest form of achievement employed by school personnel to sort and differentiate students is that of their future educational intentions. As Parson's has written:

> Though of course actual entry into college does not come until after graduation from high school, the main dividing line is between those who are and are not enrolled in the college preparatory course in high school; there is only a small amount of shifting either way after about the ninth grade when the decision is normally made (1959).

Consequently, our model selects as initial independent variables four constructs which are plausible antecedents of educational expectations, especially of

early expectations: (1) family socio-economic status (X_1, SES),[11] (2) measured intelligence (X_2, MIQ),[12] (3) parental achievement socialization practices (X_3, PASP),[13] and (4) parental educational stress (X_4, PES).[14]

Early expectations (X_5, EEFR) is defined conceptually as the realistic rather than the idealistic educational intention of the student, and has been measured with a fixed-response format item in the freshman-year survey, spring of 1967.[15]

Four variables comprise the set of early expectation consequents. As a measure of "in-school" behaviors, we have selected participation in student extra-curricular activities. In index form, these measures are for participation in the sophomore year (X_6, SASOPH) and in the senior year (X_7, SASEN).[16] Two considerations have informed our selection of this variable as a measure of "in-school" behavior. First, we concur with Dreeben that participation is an achievement behavior, and, with Bent, Kronenberg, and Boardman (1970) that student activities are an integral part of the school curriculum, contributing to the objectives of the school. On participation as an achievement behavior, Dreeben has written:

> In the course of time, pupils differentiate themselves according to how well they perform a variety of tasks, most of which require the use of symbolic skills. Achivement standards are not limited in applicability to the classroom nor is their content restricted to the cognitive areas. Schools afford opportunities for participation in a variety of extra-curricular activities, most conspicuously athletics, but also music, dramatics, and a bewildering array of club and small group activities serving individual interests and talents (1968:71).

Secondly, with but few exceptions,[17] there is a paucity of rigorous multivariate research on student activities. Including participation in our model thus permits a test of serveral pertinent propositions involving:

1. the degree to which participation, as an achievement construct, is dependent upon each of the four variables regarded as antecedents of early expectations;

2. the degree to which participation is dependent upon early expectations net of the influence of each of those four antecedents variables; and,
3. the degree to which participation itself is a net determinant of later (senior year) expectations and of actual educational attainment.

Finally, two "output" measures complete the model: (1) "later" or senior-year educational expectations (X_8, EESEM),[18] and (2) educational attainment, (X_9, EDATT).[19] The former variable is a measure from the spring 1970 survey similar in format to the freshman-year "early" expectation construct and the latter is a measure of the post-high school educational activity of the student data for which were complied by a comprehensive mail survey of the 1967 freshman-year cohort from October 1970 to March of 1971. Figure 1 depicts the model.

Figure 1 about here

PROCEDURE

Data for the analysis are from four waves of a five-wave, seven-year longitudinal panel survey of the 2790 member freshman-year 1967 "class of 1970" cohort from seven urban and suburban, public and parochial school systems in the southern tier of New York.

In April and May of 1967, all members of the cohort who were present in school were administered a one-hour, fifteen-page "Career Preference Survey." Usable instruments were secured from about 95 percent of all students enrolled, that is, from 1455 males and 1336 females. Again, during the last two months of the sophomore year, 1968, and the senior year, 1970, multi-page instruments were administered. In October of 1970, the first of a five-stage mail follow-up survey of the cohort was begun. By March of 1971, the five-mailings had yielded replies from 88 percent of all students who had participated in the 1967, freshman-year survey.

As noted above, this paper employs responses from that segment of the total sample which was present, as it were, for each and all of the four measurements. For males, the sub-sample numbers 880 or 60 percent of the initial freshman panel. For females, the sub-sample is 851, or 64 percent of the initial freshman panel. These sub-samples differ from the initial complete freshman panel in that those respondents who were present for all four surveys:

1. Are from slightly higher status backgrounds. On the 11 = high, 77 = low, Hollingshead Two Factor Index of Social Position scale (1957), the mean status level of the four-wave sub-sample is 39.47 (males) and 39.96 (females) vis a vis 40.34 and 40.37, respectively, for the complete initial freshman panel.
2. Are slightly more intelligent. Mean IQ for the four-wave sub-sample is 111.51 for males and 110.79 for females. Respective means for the complete initial freshman panel are 109.80 and 109.93.
3. Had slightly higher educational expectations as freshman than did the complete initial freshman panel. On the Hollingshead seven-level scale of educational status, where a score of 1 is "graduate or professional education," 2 is "four-years of college," 3 is "two years of college," and 4 is "graduate from high school," the mean expectation level for the four-wave males was 2.40 and for females 2.57. Respective means for the complete initial freshman panel were 2.56 and 2.69.

In essence, then, the hypothetical "population" to which the findings of this paper may be generalized are those students who complete the four-year life cycle of the secondary school.

Statistical procedures of analysis involve bi-and-multi-variate correlation and regression (path) analysis. The system into which the nine variables depicted in Figure 1 have been cast is one which is assumed to be linear, recursive (asymmetric causal flow), and additive (absence of statistical interactions or conditional relationships). For such a basic model, the path coefficient, p_{ij}, is a

partial regression coefficient in standardized form (Duncan, 1966; Land, Heise, and Duncan in Borgatta, 1969; Boyle, 1970). As such, the path coefficient may best be interpreted as the difference, in standard units, between two individuals on a dependent variable who otherwise differ by one standard unit on the given independent variable, but who are identical on all other independent variables included in the model. The value of the path coefficient represents the magnitude of the direct effect of the given independent variable on the specified dependent variable.[20]

RESULTS

Early Expectations as a Dependent and as an Independent Variable

The Nine Variables: A Temporal Sequence

Reference to Figure 1 reveals that socio-economic status (SES, X1) and measured intelligence (MIQ, X2) are the "correlated input" or exogenous variables of the system. These two variables are regarded as "pre-determined" and their relationship each with the other remains unanalyzed.[21] Parental achievement socialization practices (PASP, X3) is assumed to be dependent upon both status and intelligence. And, in comparison with what we regard as the more diffuse and enduring nature of PASP, parental educational stress (PES, X4) is construed as a more specific and recent influence on the respondent and is thus represented as dependent upon SES, MIQ, and PASP. Each of these four variables is assumed to be antecedent to freshman-year or "early" expectations (EEFR, X5) which, in turn, is depicted as an antecedent of participation in student activities, sophomore year (SASOPH, X6). All six of these variables are represented as antecedent to participation, senior year (SASEN, X7) which, given the year-long duration of those activities, is taken as antecedent to senior-year or "later" expectations, measured as it was during the final two months of the senior year (EESEN, X8). Finally, of course, dependent upon all eight variables is educational attainment, measured some six to nine months

subsequent to the time when the initial panel, freshman-year 1967, would have completed the four-year life cycle of the secondary school (EDATT, X9). Tables 1 and 2 (above diagonal) display the correlations among these variables for each sex.

Tables 1 and 2 about here

Expectations as a Dependent Variable

As a dependent variable, some thirty-one percent of the variance in early expectations is accounted for by the four antecedent variables for males; some 33 percent for females. For each sex, the path coefficients in Table 3 indicate that PASP exerts the smallest direct effect, p_{53} = .12 for males, .09 for females.

Table 3 about here

Status appears as a more important determinant of early expectations for males, with p_{51} = .24 than for females, where p_{51} = .14. For both sexes, MIQ exerts an equal effect of .29. However, while MIQ is the most potent net determinant of early expectations for males, it is parental educational stress which is the most potent determinant for females, p_{54} = 34. The greater net impact of parental stress upon expectations for females is consistent with the datum of Sewell and Shah (1968) who reported a college plans -- parental educational encouragement path of .41 for females, .34 for males.

Expectations as an Independent Variable

As an independent variable, the persistence of statistically reliable paths from early expectations to each of the four consequent variables for males and to three of the four for females (the exception is sophomore participation) is congruent with our proposition that early expectations, per se, is a net determinant of post-high school educational attainment, of later expectations, and of the two

"in-school" behaviors of senior and sophomore-year participation in extra-curriculur activities.[22]

For males, early expectations exerts the highest direct effect of any of the variables upon senior-year or later expectations, with a p_{85} of .40. As a net determinant of educational attainment, early expectations ranks forth but it is worth noting that the direct effect of early expectations, $p_{95} = .10$, combined with its one-step indirect effect via later expectations, $p_{98}p_{85} = .12$ of .22 is almost three-fourths that of the direct effect of later expectations on attainment, $p_{98} = .30$. For females, the pattern is much the same with the above-noted exception that early expectations has no direct effect on sophomore-year participation, a finding to which we shall return momentarily.

Participation in Student Activities

Some Antecedents of Participation

Given the paucity of multivariate studies of student activities, a slight excursion into a discussion of the determinants and consequences of participation is appropriate.

Reference to Table 3 reveals the not overly consequential datum that the most potent net determinant of participation in student activities during the senior-year is participation during the sophomore year, e.g., $p_{76} = .45$ for males, .41 for females. The main import of this datum, we suggest, is that there is a degree of temporal stability in participation behavior. Sophomore participation aside, however, Table 3 displays a p_{75} for males of .16 and for females of .17 indicating that the second most potent determinant of senior-year participation is early expectations. And, for males, early expectations is also the most important determinant of participation during the sophomore year, $p_{65} = .19$. We regard this finding as supporting Dreeben's view of participation as an achievement variable.

We suggest that the higher the early expectation level of a student, the higher is his achievement orientation and the more likely is he to view participation as an added area within which to develop achievement skills, to compile a record of activities which will enhance his chances for college admission, to associate with other college-bound peers, and to demonstrate actively for self, peers, parents and teachers success-oriented abilities and performances. Not consistent with this position, however, as we have already noted, is the lack of a direct effect of early expectations on sophomore participation for females. At best, we may speculate that this may be indicative of the greater and earlier saliency of career plans for boys than for girls, a saliency which also renders early expectations a more potent force in influencing later academic behavior for boys than for girls. As Douvan and Adelson concluded in their study of adolescents:

> Boys reveal a consistent preoccupation with choosing and preparing for a future vocational role [while for girls, there is a greater vagueness of career plans, a vagueness which emerges in their being] less definite about their aspirations, less realistic than boys in their plans for job preparation [including greater] ambiguities and inconsistencies in their educational plans (1966: 26, 37).

Additional evidence that, for males at least, participation is an achievement related construct comes from the direct effect of parental achievement socialization on sophomore and senior participation for males, i.e., $p_{63} = .14$, $p_{73} = .10$. Differential socialization may account for the presence of the direct effect for males and its absence for females. For, as Kerckhoff has written:

> As they get older, the school as a socialization agency takes on different meaning for both boys and girls. The basic cultural expectation that the boy will become a full-time participant in the labor force, together with the close relationship between educational attainment and occupational placement, gives academic performance a much more instrumental meaning for boys than for girls. . . . As youngsters enter

> adolescence, therefore, boys are more likely to be concerned about achievement and girls to be concerned about their personal characteristics and how well they are accepted by others (1972:101).

Social status, contrary to Hollingshead's observation of two decades ago (1949:201), does not exert much of an effect on participation in student activities (r's range from .13 to .15; paths range from .05 to .07).

Finally, measured intelligence has no net effect on the participation of males during the sophomore year but does have a net effect of .11 on participation during the senior year. For females, almost the reverse is true. Measured intelligence drops from a net effect of .16 on sophomore to .07 on senior participation. If we infer that, to a degree, MIQ is a surrogate for grades, then the increase in effect of intelligence on participation for males and the decrease for females may be reflective of an earlier social maturation for girls, one consequence of which is that girls are "sorted out" sooner in the secondary school life cycle than are boys; that is, their abilities, grades, and associated behaviors are "matched" at a time prior to that for boys. (See Lavin, 1965, for a summary of the literature on sex and grades.)

Our final reference within the context of participation is to focus attention on the paths from senior-year participation to both later expectations and to educational attainment. By way of example, p_{97} is .14 for males and .12 for females. Rank ordered among the six net determinants of attainment, senior-year participation is third for males, after later expectations and measured intelligence, and, along with early expectations, is tied for third for females, also coming after later expectations and measured intelligence.

Participation in student activities, then, does have a postive effect upon not only educational expectations but upon actual educational attainment as well. And, as our analysis has revealed, this is an impact which cannot be explained away by

reference to the associated influences of family background, parental achievement and educational socialization, and measured intelligence. What the substantive composition is of this net incremental effect of participation remains the task for subsequent research to explore and enlighten (see, however, Rehberg, 1969; Spreitzer and Pugh, 1973, for some preliminary explorations.)

Early Expectations as an Intervening Variable

In the opening section of this paper, we cited the work of Haller and Portes to the effect that senior-year data from the Wisconsin study revealed career aspirations to be a critical variable mediating between status of origin and status of destination. We concur with the import accorded to career aspirations, or, as we have defined that construct, educational expectations. But, we assert that the time point at which such mediation occurs is more toward the initial, not the terminal, year of the secondary school life cycle. We shall proceed to the analysis which bears upon the tenability of that assertion. Just prior to doing so, however, we should, following Finney (1972) and Charner and Cohen (1973), introduce some much needed clarifying distinctions into the language of path analysis.

Consider, for a moment, an abbreviated version of our model where EESEN, SASEN, and SASOPH have been eliminated to simplify discussion. Our focus for this illustration is upon the EDATT -- PES relationship. The overall measure of this association is the correlation coefficient, r_{94}. In a causal mode, this correlation can be decomposed into two major components:[23]

1. A non-causal component of the relationship between a dependent and an independent variable. For example, the non-causal component of the EDATT - PES relationship is that which can be attributed to the antecedents of PES, that is, to PASP, SES, and MIQ.
2. A causal component of the relationship between a dependent and an independent variable. In our illustration, it is that portion of

the EDATT -- PES correlation which reflects the degree to which variations in PES, net of concomitant variations in its antecedents of PASP, SES, and MIQ produce variations in EDATT. This portion of the correlation is (re)defined by Finney as the total effect of an independent variable on a dependent variable. When so defined, the total effect of a given independent variable can be decomposed further into:

a. That portion which represents the influence of the independent variable on the dependent variable acting through or mediated by one or more variables which intervene between the independent and the dependent. In this simplified illustration, it would be that portion of the causal component reflecting any influence which PES might have on EDATT through EEFR. This portion of the total effect is referred to as the indirect effect of PES on EDATT.

b. That portion which represents the influence of the independent variable on the dependent variable net of any indirect influences through one or more intervening variables. This portion of the total effect is referred to as the direct effect of PES on EDATT, is quantified as the path coefficient p_{94}, and is an estimate of the proportion of a standard deviation unit by which two individuals differ in EDATT given that they differ by one standard unit in PES but are identical on all other independent variables.

Results

As part of the decomposition of the correlation coefficients for antecedent -- consequent variable relationships, Table 4 provides data in percentage form which indicate what portion of the total effect of each antecedent on each consequent is

Table 4 about here

indirect via early expectations.

Beginning with the early expectation antecedent of parental educational stress, we observe first that a substantial portion of the correlation between each

consequent of early expectations and stress is, in the Lazarsfeldian sense (1955: 121-25), "explained away" by its antecedents of achievement socialization, measured intelligence, and status. For males, a comparison of the respective total effects with the correlations reveals the "explanatory" portion to average at least 50 percent. For females, the portion attributable to the influences of those variables prior to stress is less, averaging some 30 percent.

When the basis for comparison is not the correlation coefficient but the total effect and when the sum of the indirect effects flowing from stress through early expectations to one of its four consequent variables is expressed as a percentage of the total effect, those percentages reveal much of the influence of stress to be indirect via early expectations. Most conclusive are the percentages for males, i.e., the percentage of the influence of stress which is mediated by early expectation is: (1) 93 to educational attainment, (2) 89 to later expectations, (3) 52 to senior participation, and (4) 78 to sophomore participation. Somewhat less definitive but, with one exception, still supportive of early expectations as a mediating variable are the stress data for females. Fifty-five percent of the total effect of stress to attainment is mediated by early expectations, 67 percent to senior expectations, 33 percent to senior participation. Understandable within the context of our earlier finding of a virtual absence of any direct effect of expectations on sophomore participation for females is the absence of any indirect effect of stress via early expectations to female sophomore participation (1.5 percent).

Moving back one variable in the model to parental achievement socialization practices, we observe for males especially, that less of the correlation between any consequent of early expectations and achivement socialization is "explained away" by its antecedents than was true for educational stress. For both males and females, the explanatory portion of the correlations of achievement socialization

with the consequents of expectations seldom exceed 25 to 30 percent. Similarly, howevr, just as less of the correlation between any consequent of early expectations and achivement socialization is explained away, so too is less of the total effect of achievement socialization mediated by early expectations. With but two exceptions, the percentage of the total effect of achievement socialization which is indirect and mediated by early expectations averages between 20 and 35. The first exception is that for male "later" expectations where "early" expectations transmits some 68 percent of the total effect of achievement socialization. The second exception is for female sophomore participation where only 3.3 percent of the total effect is transmitted by early expectations, a datum which, again, we note is consistent with the virtual absence of any direct effect of early expectations on sophomore participation for females.

Moving back one more step to each of the two correlated input variables, we examine first the pattern for measured intelligence. Given that MIQ has no antecedents and that its joint relationship with status is minimal ($r = .12$ for males, .20 for females), it is not surprising that most of the correlation of MIQ with each of the consequents of early expectations is in the form of a total effect; very little of each correlation can be attributed to its unanalyzed correlation with status. For both sexes, the total effect of MIQ averages at least 85 percent of its correlations with the respective consequents of early expectations.

As the correlations of MIQ with each of the consequents of early expectations are decomposed, we note immediately that a larger portion of each is in the form of a direct effect than is true for any of the other variables antecedent to early expectations. Two illustrations may suffice: for females, 35 percent of the EDATT -- MIQ correlation is a direct effect of MIQ; this compares with 22 percent when the independent variable is PASP, 12 percent for PES, and 29 percent for SES.

For males, 49 percent of the SASEM -- MIQ correlation is a direct effect of MIQ compared with 38 percent for PASP, 23 percent for PES, and 3.9 percent for SES. Nevertheless, EEPR does mediate between a fifth and a third of the total effect of MIQ on educational attainment, about a third of the total effect on later expectations, and slightly more than a fourth (females) to slightly more than a third (males) on senior participation. Again, however, for females, early expectations mediates almost none of the total effect to sophomore participation. In contrast, the table reveals that for males more than two-thirds of the total effect of MIQ on sophomore participation is mediated by early expectations.

Status is the last antecedent variable. As with measured intelligence, a substantial portion of each of the correlations of status with the consequents of early expectations is in the form of a total effect--an average of seventy percent or more. When, however, the point of comparison between status and intelligence is the portion of each total effect that is direct, the pattern for status is opposite that described for MIQ. For, while that portion averaged a third or more for MIQ, it averages a third or less for status. Much of the total effect of status, then, upon those variables consequent to early expectations is <u>indirect</u> and, as the respective percentages reveal, with the female sophomore participation--early expectation relationship the usual exception, between 28 and 53 percent of the total effect of status is indirect by way of early expectations.

At this juncture, we constrict the scope of dependent or consequent variables from four to one: the ultimate dependent variable of post-high school educational attainment. We do so in order to consider the mediating function not only of early but of later expectations as well. In the analyses reported just above, the proportion of any total effect of an antecedent variable on attainment which was indirect by way of early expectations included those indirect effects which were

mediated through early expectations to attainment without "passing through" later expectations to attainment and those effects which were mediated through early and later expectations to attainment. Now we wish to consider what portion of the total effect of an antecedent variable on attainment is mediated through later expectations exclusively, i.e., not passing first through early expectations. And, finally, we shall consider the portion of each total effect on attainment which is mediated by both early and/or later expectations and by later expectations exclusively, thus generating an estimate of the total linkage function of expectations in the educational status attainment -- family background process.

Two patterns, with some exceptions, emerge from this analysis. First, for females, with the exception of parental educational stress, about as much of the total effects of achievement socialization, measured intelligence, and status are mediated by later expectations exlusively as by early and/or later expectations. For example, 28 percent of the total effect of achievement socialization on attainment is mediated by later expectations exclusively, 29 percent by early and/or later expectations. Similarly, 27 percent of the total effect of intelligence is mediated by later expectations exclusively, 25 percent by early and/or later expectations. Parental educational stress is the major exception to this pattern for females. Later expectations exclusively mediates 14 percent of the total effect of stress compared with 55 percent mediates by early and/or later expectations.

For males, with measured intelligence as the exception, the pattern is one where later expectations exclusively mediates a markedly smaller percentage of the total effects. Exclusive of early expectations, later expectations mediates some 9 percent of the total effect of the stress, compared with 93 percent mediated by early and/or later expectations. For achievement socialization, later expectations

exclusive of its early counterpart mediates 7 percent of the total effect compared with 28 percent for early and/or later expectations. And, for status, later expectations itself mediates 15 percent of the total effect compared with 33 percent for early and/or later expectations. Measured intelligence, as we have noted, is the exception to the pattern. Twenty percent of its total effect is mediated by later expectations itself, twenty percent by early and/or later expectations.

When taken together, that is, later expectations exclusive of early expectations and early and/or later expectations, it is apparent that this construction of educational intentions does indeed serve as a critical set of linkages between the components of a student's status of origin and educational attainment, an indicator of his status of destination.

As Table 4 illustrates, these constructs mediate:

1. All of the total effect of parental educational stress for males and more than two-thirds of that for females.
2. About half of the total effects of status for males and females.
3. Some two-fifths of the total effect of intelligence for males, about half of the total effect for females; and,
4. More than a third of the total effect of parental achievement socialization for males, more than half of the total effect for females.

Such sex differences as have emerged from the analyses reported just above are intriguing. On the one hand, the data reveal a definite tendency for early and/or later expectations, rather than later expectations exclusively, to mediate more of the total effects of the early-expectation-antecedent to educational attainment relationships for boys than for girls. On the other hand, there is the suggestion that both early and/or later expectations and later expectations exclusively mediate approximately the same or even greater percentages of those relationships for girls than for boys. We are tempted to understand this finding

within the context of the previously mentioned sex differential in the timing of career intention crystalization.

Boys, it will be recalled from our mention of the Douvan and Adelson study, exhibit a greater pre-occupation, realism, and definitude than do girls with career choice. Boys crystallize their plans earlier than do girls--an inference consistent with the higher correlation between early and later expectations for boys (.57) than for girls (.48) (Tables 1 and 2). And, as an intention crystallized at an earlier time, freshman expectations for boys is both a greater determinant of subsequent in-school variables--witness the generally higher correlations and path coefficients between early expectations and participation and senior expectations for boys than girls, and is a stronger mediator between background variables and those subsequent in-school variables--witness the generally higher percentages of total effects of the background variables which are indirect via early expectations, boys versus girls, to each of the three in-school measures.

By the senior year, however, it would appear that the educational intentions of both boys and girls are about equally crystallized. Indeed, there is even a suggestion that by the end of the senior year girls may be more definite about their futures than are boys. Highly speculative though it may be, it is true that, taken together, early and/or later expectations and later expectations exclusively mediate a higher percentage of the total effects of MTQ and PASP to EDATT for girls than for boys and an almost equal percentage of the total effect of status. And, finally, though the difference is not large, the correlation of senior expectations with educational attainment is higher for females ($r = .61$) than for males ($r = .55$).

Summary

With but one major qualification, we believe that the evidence just reviewed establishes the major thesis of this paper; namely, that "early" educational ex

expectations, i.e., those expressed by the student in the initial rather than in the terminal year of high school, mediates a sizeable portion of the total effects of the various components of the student's status of origin both to certain behaviors which occur during the four-year life cycle of the secondary school and to actual educational attainment itself--a component of his ultimate status of destination.

The major qualification, of course, is sex. For both in-school measures and subsequent attainment itself, early expectations mediates comparatively more of the background influences for males than for females, although when both early and later expectations are considered together, their combined contribution to the mediation of background variables to attainment is, for males, similar to if not somewhat less than that for females. This sex difference we have elected to interpret within the context of previous research which has shown, at least for the initial years of high school, that the career intentions of boys begin to crystallize before those of girls. Our data warrants the added inference that by the end of the terminal year of high school the career intentions of each sex are about equally crystallized.

CONCLUSION AND IMPLICATIONS.

Writing on "The Significance of Career Beginnings" in The American Occupational Structure, Blau and Duncan assess the import of the first-job or career beginning in the status of origin -- status of destination sequence:

> The data testify that social origins exert a direct effect on later careers in addition to that mediated by career beginnings. . . . This demonstrates that career beginning is an intervening variable in the relationship between occupational origin and occupation in 1962 [i.e., "later" occupation]. A good part of the influence of social origins on subsequent occupational life is due to the influence

> of origins on career beginnings, which in turn affect later careers (1967:49).

Blau and Duncan were concerned with occupational attainment as the terminal locus in the status of origin -- status of destination sequence. Their focus was early job or career beginnings which their analyses revealed was a critical mediating variable linking status of destination with social origins.

Our concern has been with educational attainment as the defining locus in the status of origin -- status of destination sequence. Our focus has been early or freshman year educational expectations. To a marked degree, and for males especially, our analyses have revealed early educational expectations to be a critical mediating variable linking educational attainment with social origins. As the educational attainment analog of career beginnings, two issues of some consequence are raised. They irvolve: (1) the strucutral and social psychological dynamics by which early expectations affect the educational career of the individual, and (2) the implications for educational policy which arise from regressing the "point of balance" in the educational attainment process back from the terminal to the initial year of high school.

Some Dynamics of Early Expectations

It is one of the paradoxes of youth in industrial societies that as the period of youth has been extended first through the later teens, then to the early and mid-twenties, and now, for some, into the early thirties, that, as Douvan and Adelson have commented, there is a

> growing pressure on children in our culture . . . for early commitment to an occupation or at least to a class of occupations. This pressure appears in vocational counseling courses in the schools which now begin as early as the fourth grade in some cities (1966:27).

Such a commitment, or, if not a commitment, then at least a provisional decision, we are convinced, is made during the final phases of the elementary school

period through to the initial phases of the secondary school period. Decisions on educational goals, however, may be more definitive than decisions on occupational goals, particularly for males. A characteristic of an educational goal decision made during early adolescence which imbues it with particular significance is that the expectation expressed by the adolescent becomes for him a label, a symbol which triggers in others an expectancy set of behaviors which they believe they can reliably anticipate from the adolescent. Thus, the student who bears the label of "college-bound" can be expected by his teachers to be "intelligent," "academically motivated," "interested in books and ideas," etc., while his non-college peer will be thought of as less intelligent, academically apathetic, and as more concerned with cars than with books.

At a minimum, this labeling process impinges on the adolescent in at least two ways:

1. Ceteris paribus, as we have shown in a recent paper (Rehberg and Hotchkiss, 1972), the early expectation of the adolescent is perhaps the most important single influence on the career advice accorded the student by the teacher and the guidance counselor. A plausible extension of this finding is that the early educational expectation of the adolescent is a major determinant of the educational channel in which the student will find himself throughout his secondary school career. Indirect support for this conjecture comes from the inference by Jencks and his colleagues that the personal preference of the student is the most important determinant of the curriculum in which he is placed during the secondary school period (1972:34). Whether the student is located in the college or non-college track, or whether he takes his courses at the "honors," "college-bound," "general," or "opportunity" level, may, to a significant degree depend upon the realistic educational goal he expresses upon entry into the high school.

2. Particularly when that early expectation is "certified" by placement in a curriculum congruent with that expectation, a whole sequence of events can be set in motion the outcome of which is to verify a self-fulfilling prophecy. Thus, in a college curriculum, the academic faltering of a student is likely to initiate a series of equilibrium restoring events ranging from teacher remarks to teacher conferences to counselor appointments to teacher-and-counselor-and-parent sessions, etc. It is, of course, unlikely that such resources would be expended were a non-college curriculum student to falter academically. And, we suspect that as between college and non-college curricula, symmetry does not prevail. For, while downward movement from a college to a non-college curriculum can occur, the reverse is less likely; the accumulated course deficits would make it all but impossible for the non-college student to transfer "upwards" much beyond the middle of the sophomore year.

Several investigators have commented upon the impact of the labeling phenomenon associated with the expression of early educational expectations. Williams, in an effort to understand the association between the educational expectations held for students by teachers and the expectations of the students themselves has described how such self-sustaining processes affect the student's progress through the secondary school.

> The expectations held for a particular student [by teachers] are to some extent identified with the expectations held for the group as a whole. This also suggests that the particular structural arrangements schools make to deal with ability and/or performance differences may be crystallizing the expectations teachers have, in effect, tending to lock the student into an expected future based on early achievements and unaffected by later changes, at least insofar as the teacher is concerned (1972:129).

And, from their study of "Lakeshore High," Cicourel and Kitsuse sketch some of the dynamics by which schools maintain the expectation equilibrium of students who are college bound:

> The differentiation of college-going and non-college going students defines the standards of performance by which they are evaluated by the school personnel and by which students are urged to evaluate themselves. It is the college-going student more than his non-college-going peer who is continually reminded by his teachers, counselor, parents, and peers of the decisive importance of academic achievement to the realization of his ambitions. . . . What we take to be the serious issue is that the college/non-college decision has become <u>the</u> decision with reference to which the student is assigned to courses, evaluated as to performance, and organizationally processed. . . . We are concerned . . . that the organizational emphasis upon talent and the pursuit of narrow specialties virtually ignores the significance of adolescence as a period during which individuals may explore the alternatives of personal style, interests, and identity. With the diffusion of specialized educational programs . . . into the lower school systems, the adolescent is forced to make decisions and declare choices from a range of alternatives he can hardly be expected to know (1963:146-7).

Early educational expectations, then, is not only the culmination of past structural and processual influences, it is also a major determinant of the experiences which the student will encounter as he proceeds through high school. But what of the consequences for the student and for the school, and for the larger society, of this tendency toward an earlier and earlier closure of educational choice? What are the implications of early expectations as a determinant of both in-school behavior and of educational attainment itself?

Implications

We and other investigators have argued with conviction that in schools as they are presently organized the early educational expectation of the individual sets into motion institutional and inter-personal mechanisms which affect his career during and subsequent to high school. The effect of the contingencies activated by this early expectation upon the individual is, in our opinion, negative and pernicious. It is so because the differentiated course structure of the high school, as Coleman perceptively notes:

> . . . takes as a <u>given</u> what should be problematic--that a given boy is going into a given post-secondary occupational or educational path. It is one thing to take as a given that approximately 70 percent of an entering high school freshman class will not attend college, but to assign a particular child to a curriculum designed for that 70 percent closes off for that child the opportunity to attend college. Yet to assign all children to a curriculum for the 30 percent who will attend college creates inequality for those who, at the end of high school, fall among the 70 percent who do not attend college. This is a true dilemma, and one which no educational system has fully solved (1968:13).

Although we have no solution to this dilemma, we do have a value premise upon which we believe tentative solutions should be predicted. It is our conviction that a more desirable state of affairs prevails the greater are the number of options open to the individual. And, with the prolongation of youth in industrialized societies, we hasten to add that an even more desirable state of affairs prevails the longer are those greater number of options kept open for the individual.

Our derivation from this premise is that there be established one or more experimental demonstration programs designed to maximize the quantity and quality of career options open to the individual, beginning with the later elementary school years.

We suggest that this program be designed with the explicit recognition that:

1. There is a difference between "schooling," or learning the basic skills of literacy and calculation, and "education," or training for competent functioning in the political, economic, and inter-personal spheres of life (Bereiter, 1972; Coleman, 1972).
2. Schools, as presently constituted, probably "school" better than they "educate."
3. There probably is no way in which schools could be redesigned so that both "schooling" and "education" would be executed with excellence within the same organization.

4. While children can be schooled within schools, they can be educated outside of the schools but within such non-school institutions as those of the private productive sector and the private and public service sector.

5. As Coleman has asserted:

> It is not only some young people who need the non-intellective portions of education, it is all. Thus, it is not the persons who must be divided into different tracks to learn different skills; it is the time of each person that must be so divided (1972:435).

While by no means original, some may judge our proposal to be too distant a departure from the basic thesis of this paper: early educational expectations as a critical variable in the educational attainment -- status of origin sequence. We believe that such distance is more apparent than real. Until the last three or four pages, our concern was to add one more bit of empirical evidence to the growing literature on the early crystallization of career goals among American youth, particularly educational goals among boys. In these last few pages, our concern has not been with that datum as fact, but with the social and individual consequences of that fact. Early adolescence is too early a time for an individual to opt into one career channel when opting into that one channel precludes or retards his opting out of that channel and into another one at a later date. Adolescence, we believe, ought to be a time for the expansion of experiences, not for the restriction of opportunities. We believe that our educational processes should be (re)organized to maximize this value. It is even possible that, as Coleman has conjectured, such a reorganization might reduce the relationship between educational performance and family status--the concern with which he began this paper.

FIGURE 1

Basic Path Model

(Path arrows deleted for clarity of presentation)

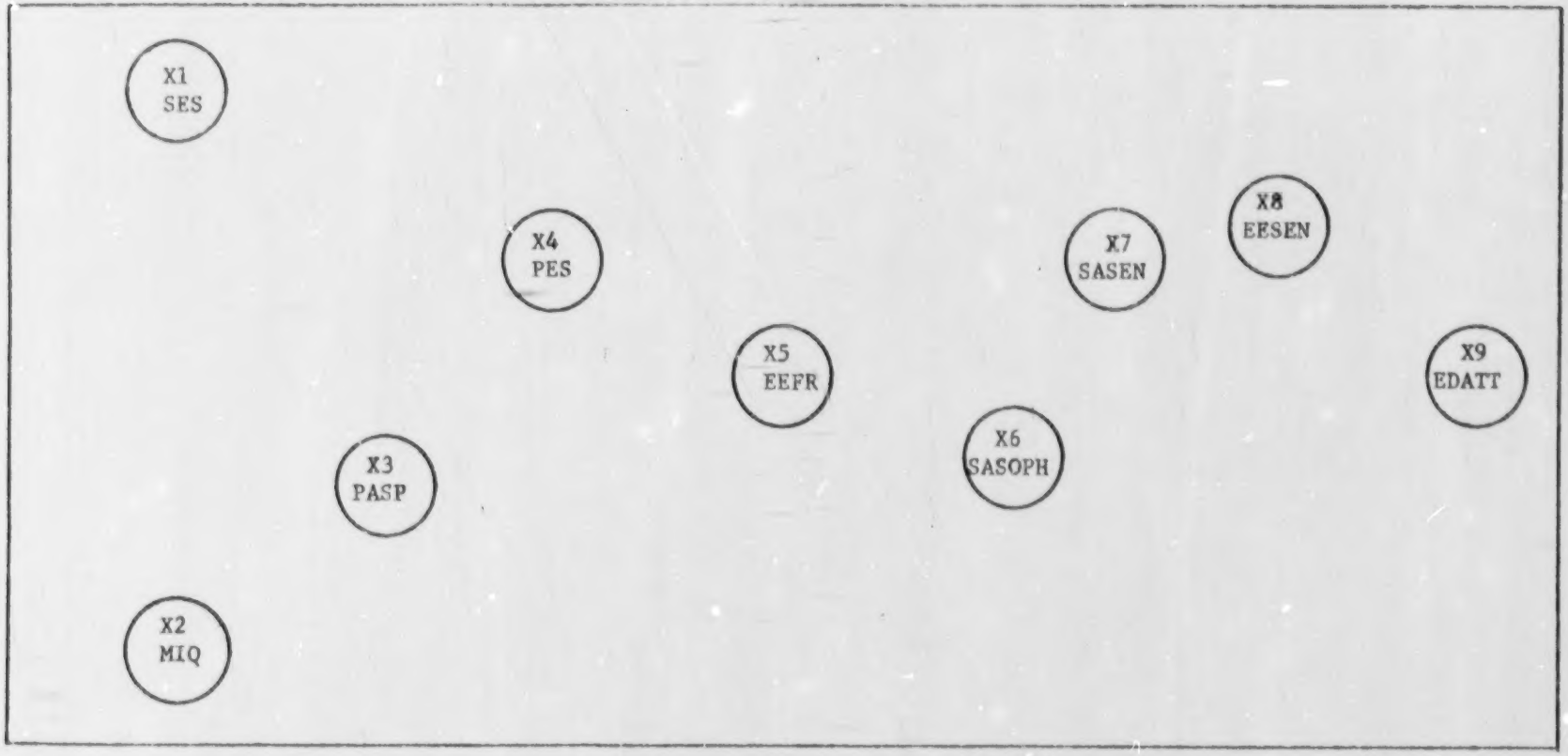

TABLE 1

Zero-order Correlation Coefficients for the Nine System Variables: Males

(Original correlation coefficients above the diagonal and re-generated correlation coefficients below the diagonal, with decimals omitted)*

Variables: Nr.	Name		9	8	7	6	5	4	3	2	1
			Variables								
9	Educational attainment	EDATT		55	36	20	45	20	23	46	28
8	"Later" expectations	EESEN	54		32	23	57	24	18	45	29
7	Participation, senior yr.	SASEN	36	32		52	34	20	24	22	15
6	Participation, soph. yr.	SASOPH	21	20	52		25	13	20	11	14
5	"Early" expectations	EEFR	45	57	34	25		36	25	37	33
4	Parental educ. stress	PES	19	22	16	12	36		30	15	14
3	Par. achieve. soc. pract.	PASP	22	16	24	20	25	30		07	15
2	Measured intelligence	MIQ	46	45	22	09	37	15	07		12
1	Socio-economic status	SES	27	29	15	14	33	14	15	12	

*For an explanation of original and re-generated matrices, see reference note Nr. 22.

TABLE 2

Zero-order Correlation Coefficients for the Nine System Variables: Females

(Original correlation coefficients above the diagonal and re-generated correlation coefficients below the diagonal, with decimals omitted)*

Variables: Nr.	Name		9	8	7	6	5	4	3	2	1
			Variables								
9	Educational attainment	EDATT		61	34	23	46	30	25	42	25
8	"Later" expectations	EESEN	61		31	19	48	29	24	39	22
7	Participation, senior yr.	SASEN	33	30		46	27	22	13	23	13
6	Participation, soph. yr.	SASOPH	20	19	46		18	25	10	22	14
5	"Early" expectations	EEFR	45	47	27	17		46	26	41	26
4	Parental educ. stress	PES	25	26	19	25	45		31	22	18
3	Par. achieve. soc. pract.	PASP	24	23	10	10	26	31		18	08
2	Measured intelligence	MIQ	42	39	23	22	41	22	18		20
1	Socio-economic status	SES	25	22	11	14	26	18	08	20	

*For an explanation of original and re-generated matrices, see reference note Nr. 22.

TABLE 3

Path Coefficients: "Trimmed" Model for Males and Females*

Sex: Variables: Independent		Variables: Dependent						
		PASP 3	PES 4	EEFR 5	SASOPH 6	SASEN 7	EESEN 8	EDATT 9
MALES:								
V1: Socio-economic status	SES	15	08	24	05	--**	11	09
V2: Measured intelligence	MIQ	05	12	29	--	11	27	24
V3: Par. achieve. soc. pract.	PASP		28	12	14	10	--	09
V4: Parental educ. stress	PES			25	--	--	--	--
V5: "Early" expectations	EEFR				19	16	40	10
V6: Participation, soph. yr.	SASOPH					45	--	--
V7: Participation, senior yr.	SASEN						11	14
V8: "Later" expectations	EESEN							30
FEMALES:								
V1: Socio-economic status	SES	17	13	14	07	--	07	08
V2: Measured intelligence	MIQ	04	14	29	16	07	20	15
V3: Par. achieve. soc. pract.	PASP		28	09	--	--	10	06
V4: Parental educ. stress	PES			34	20	--	--	--
V5: "Early" expectations	EEFR				--	17	31	12
V6: Participation, soph. yr.	SASOPH					41	--	--
V7: Participation, senior yr.	SASEN						16	12
V8: "Later" expectations	EESEN							42

*For an explanation of a "trimmed" model, see reference note Nr. 22.

**"--" indicates that the particular path coefficient was less than twice its standard error

TABLE 4

Decomposition of the Total Effects of the Antecedents of Early Expectations on the Consequents of that Mediating Variable into Direct and Indirect Effects and the Percentage Decomposition of the Indirect Effects into those Components Mediated via Early Expectations and, for Educational Attainment, via Early and Later Expectations, for Males and Females

Indep. Vbles.	Composition of Effects	Dependent Variables SASOPH		SASEN		EESEN		EDATT	
		Ma.*	Fe.*	Ma.	Fe.	Ma.	Fe.	Ma.	Fe.
SES	Correlation	.140	.135	.151	.125	.288	.218	.276	.250
	Total effect	.129	.095	.125	.083	.235	.144	.222	.173
	Direct effect	.055	.066	.006	.010	.103	.068	.095	.072
	Indirect effect	.075	.029	.119	.072	.133	.077	.127	.100
	% of total eff. via EEFR	41.0	02.1	52.8	34.9	51.5	41.7	33.3	28.3
	% of total eff. via EESN ex. EEFR**							15.3	20.8
	% of total eff. via EEFR and EESN							48.2	49.1
M.I.Q.	Correlation	.105	.217	.224	.227	.453	.391	.458	.419
	Total effect	.089	.197	.208	.210	.423	.361	.431	.384
	Direct effect	.020	.157	.110	.064	.269	.198	.239	.147
	Indirect effect	.069	.041	.099	.146	.154	.163	.191	.237
	% of total eff. via EEFR	68.5	01.5	36.1	27.6	32.6	32.4	19.5	25.3
	% of total eff. via EESN ex. EEFR							19.5	27.1
	% of total eff. via EEFR and EESN							39.0	52.4
PASP	Correlation	.196	.102	.237	.129	.179	.240	.227	.245
	Total effect	.175	.061	.209	.087	.117	.169	.169	.168
	Direct effect	.137	.005	.090	.026	.014	.090	.089	.055
	Indirect effect	.039	.056	.119	.061	.104	.078	.079	.112
	% of total eff. via EEFR	20.0	03.3	20.6	33.3	68.4	34.9	28.4	28.6
	% of total eff. via EESN ex. EEFR							06.5	28.0
	% of total eff. via EEFR and EESN							35.5	56.5
PES	Correlation	.130	.246	.201	.223	.235	.289	.199	.299
	Total effect	.058	.199	.108	.162	.123	.164	.068	.164
	Direct effect	.013	.195	.046	.030	.014	.039	.009	.035
	Indirect effect	.045	.003	.062	.132	.109	.125	.076	.129
	% of total eff. via EEFR	77.6	01.5	51.9	32.7	88.6	66.5	92.6	54.9
	% of total eff. via EESN ex. EEFR							08.8	14.0
	% of total eff. via EEFR and EESN							100.0	68.9

*Ma. = male, Fe. = female

**ex. = excluxive of

REFERENCES

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2. For a critical and penetrating essay on the distinction between inequality of opportunity and inequality of rewards, see Coleman (1973).

3. Certainly, this type of motive force may be imputed to the work of Christopher Jencks and his colleagues (1972), to the study of Gutherie, et. al. (1971), etc.

4. Exacerbated, we would add, by the generally negative results emerging from the evaluation studies of the various compensatory education programs (see, for example, McDill, McDill, and Sprehe, 1969).

5. On this point, see Stinchcombe's review of Inequality in the November 10th issue of Science. It is his contention that the importance of a social variable such as educational attainment should be assessed not by comparing the variance it explains to the total variance in a variable such as income, but to the total variance in income explained by the independent variables of the system. Thus, Stinchcombe writes that:

> This means, for example for income, that I will ignore the 77 percent of the variance that is, as far as we know now, due to luck . . . and try to assess the importance of causes relative to the socially patterned inequality, the other 23 percent (1972:604).

6. Possibly the most succinct assessment of educational attainment in this vein is found in Duncan's paper, "Ability and Achievement," (1968).

7. On this neologism for "error variance," see the essays of Thurow (1973) and Coleman (1973).

8. "Expectations" is a construct which we conceptually and operationally distinguish from "aspirations." The former we use in reference to the realistic, the latter to the idealistic, dimension of a career orientation. See, for example, Rehbert (1967).

9. This position is similar to that of Parsons in his essay on "The School Class as a Social System," (1959).

10. See, for example, the works of Sewell and his colleagues, a good source for which is the reprint of his Presidential Address to the 66th Annual Meeting of the American Sociological Association (1971). See also the work of Jerald G. Bachman and his colleagues and of Rehberg, Sinclair, and Schafer (1970).

11. SES is measured with the Hollingshead (1957) Two Factor Index of Social Position based on a weighted combination of scores assigned to the occupation and the education of the major breadwinner.

12. MIQ scores are from the Otis and California Mental Maturity tests administered by the participating schools during the early part of the ninth grade.

13. PASP is a summative measure of an index of achievement socialization items, including (a) the degree to which the adolescent participates in family decision-making, (b) the frequency with which each parent explains rules or provides reasons for decisions; and (c) the frequency with which each parent praises the adolescent for tasks well done.

14. PES is a summative measure of an index with two components: "During the last few years or so, has your father [mother] wanted you to continue your education beyond high schoo, that is, to go to a trade or business school, to college, etc.?" Five fixed-alternative response categories ranged from "Yes, he [she] has stressed it a lot," to "No, he [she] would rather that I did not go beyond high school."

15. Following a paragraph differentiating between an aspiration and an expectation, the educational expectation item read:
CONSIDERING your abilities, grades, financial resources, etc., how far do you actually EXPECT TO go in school?
    1. __ 10th or 11th grade
    2. __ Graduate from high school
    3. __ Trade or technical school
    4. __ Two-year business school
    5. __ Nursing school
    6. __ Two years of college
    7. __ Four years of college
    8. __ Graduate or professional school

Response levels were collapsed and coded to correspond with the educational scale of the Hollingshead Two Factor Index of Social Position.

16. Participation in student activities has been measured by summing the number of activities, from a total of fifteen, in which the student reported participation during his sophomore and his senior years.

17. Among the exceptions to the paucity of multivariate studies of student participation are the works of Schafer (1968, 69); Schafer and Armer (1968); Schafer and Rehberg (1970); Rehberg (1969); Rehberg and Schafer (1968); Spady (1970); and Spreitzer and Pugh (1973).

18. Senior-year educational expectation was measured with an item similar to that used for the freshman-year measure.

19. Educational attainment was measured with the Hollingshead educational scale code of responses to structured items secured from the post-high school mail survey.

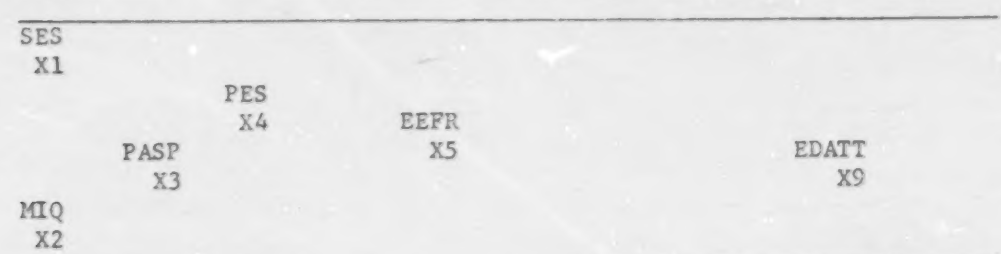
20. The path analysis literature is replete with verbal interpretations of path coefficients. Frequently, such interpretations are, implicitly or explicitly, couched in terms of "change" in the dependent variable y resulting from a unit change in the independent variable x, ceteris paribus. The terminology of change implies change over time in the sense that a manipulation of x will produce a subsequent change in y--for any given individual. For most social research, however, the only observed "change" is across individuals rather than across time. Hence, path coefficients measure differences between individuals rather than changes within individuals over time. On occasion, two or three panels of observations on the same individual are available. The present study utilizes three panels, but the authors believe that even when panel data are used in analysis, path coefficients are best interpreted in terms of differences between individuals unless change scores are used or a model of change justifying alternative interpretations is made explicit. For example, we would not care to interpret the path coefficient connecting senior-year expectations to father's status (measured in the freshman year) as the degree to which a student whose father's status (contrary to the assumptions of the text) changed one standard unit (in four years) would change his individual expectations (in the same four years). Rather, we would

prefer to interpret the path coefficient as an (average) difference in senior-year educational expectations between two students who are the same on all variables except father's status and differ by one standard unit on father's status. Presumably differences between individuals at any time result from some process of change over time. But, even if this last point is granted, the regression coefficients or path coefficients may not be identical to change coefficients. The reader is referred to Coleman (1968) for a fascinating treatment of models of change over time. Coleman shows that change coefficients are seldom identical to regression coefficients and provides formulae for calculating change coefficients under varying assumptions about the process of change during a measurement interval.

21. For a discussion of the "unanalyzed" correlation between status and intelligence, see Duncan (1968) and Duncan, Featherman, and Duncan (1968).

22. The criterion used for determining whether a path coefficient is "statistically significant" is that the coefficient be equal to or greater than twice its standard error. Where a path is not significant, the variable generating that path is deleted and the values for that particular set of paths re-calculated. This is the process which Heise (1969) has referred to as "theory trimming." That such deletions have not seriously impaired the mathematical adequacy of the model is evident from a comparison of the regenerated with the original correlation matrix, as per below and above the diagonals, respectively, Tables 1 and 2. Few of the regenerated r's differ by more than .050 from their original counterparts (Heise, 1969; Spady and Greenwood, 1972).

23. Graphically, the simplified model can be represented:



Using the correlations from Table 1 (males), and in accord with the distinctions developed by Finney and articulated in our text:

a. The correlation of EDATT with PES, $r_{94} = .1990$.

23. (continued)

b. The causal component of that correlation consists of:

1) The direct effect of PES on EDATT, $p_{94} = .0047$

2) The indirect effect of PES on EDATT and only the indirect effect, in accord with Finney's principle that an indirect effect is that which one variable has upon another by way of an intervening variable, in this case the effect which PES has upon EDATT by way of EEFR, i.e., $p_{95}p_{54} = .0627$.

Summing the direct and indirect effects thus yields the total effect of PES on EDATT: TE of PES on EDATT = $p_{94} + p_{95}p_{54} = .0047 + .0627 = .0674$.

c. The non-causal component of r_{94} is that part of the correlation due to the effects of any antecedent variable, X1, X2, and X3 on both X4 (PES) and on X9 (EDATT). In equation form these components consist of:

$$p^{91}p^{41} + p^{92}p^{42} + p^{93}p^{43} + p^{91}p^{43}p^{31} + p^{91}p^{42}r21 + p^{92}p^{43}p^{32} + p^{92}p^{41}r21 + p^{93}p^{41}p^{31} + p^{95}p^{53}p^{43} + p^{95}p^{52}p^{42} + p^{95}p^{51}p^{41} + p^{91}p^{43}p^{32}r21 + p^{93}p^{41}p^{32}r21 + p^{95}p^{51}p^{42}r21 + p^{95}p^{52}p^{41}r21 + p^{95}p^{53}p^{42}p^{32} + p^{95}p^{52}p^{43}p^{32} + p^{95}p^{51}p^{43}p^{31} + p^{95}p^{51}p^{43}p^{32}r21 + p^{95}p^{53}p^{41}p^{32}r21 + p^{95}p^{53}p^{42}p^{31}r21 + p^{95}p^{53}p^{41}p^{31} + p^{95}p^{52}p^{43}p^{31}r21 + p^{92}p^{43}p^{31}r21.$$

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